Such bare rock surfaces, however, have also been explained as due to recent subsidence or submarine eruptions, and are not alone conclusive evidence of deep-sea currents. The wide distribution of land material at sea by the wind is illustrated by a map of the tropical Atlantic showing the areas reached by African dust.

The deposits next outside the continental shelf are classified by Prof. Andrée as the Hemipelagic group, a term introduced by Krummel, of which among the most interesting are the glauconites. The Eupelagic, the typical oceanic deposits, include the true oozes, for which the author conveniently accepts the term Schlamm, although it has been used by Walther and Penck as the equivalent of mud. It would be an advantage if German authorities adopted the author's nomenclature. The account of the abyssal oozes is especially full and instructive. Prof. Andrée discusses various attempts to estimate geological time by the accumulation of the deep-sea deposits; but comparison of the rapid rate indicated, according to Murray, by the covering of cables, with the extremely slow rates claimed by Lohmann, justifies the author's conclusion that the materials are still too scanty and contradictory to yield trustworthy conclusions.

The last sections of the book deal with the stratigraphy of the younger marine deposits and with the quantity of radium in the sediments. An account is given of the geographical distribution of the various deposits in the different oceans, which is illustrated by an excellent map. The final chapter on the useful materials found on the sea-floor is the most scanty and least satisfying; marine placers, for example, are dismissed in a short paragraph. In connection with these deposits, the author remarks, regarding the much discussed question of the occurrence of gold in sea-water, that its presence has not yet been proved; he considers that the belief in gold as a constituent of sea-water rests on gold introduced in the reagents. This conclusion is, however, difficult to reconcile with the blank results obtained by Prof. Liversidge in the test analyses of pure water conducted at the same time as those of his samples of sea-waters. J. W. GREGORY.

Study of Plants in the Field.

The Outdoor Botanist. By A. R. Horwood. Pp. 284+20 plates. (London: T. Fisher Unwin, Ltd., 1920.) 18*s*. net.

THE sub-title of this work, "A Simple Manual for the Study of British Plants in the Field," indicates the main purpose of the author, who dedicates the book to the veteran field-botanist, Dr. G. Claridge Druce. To achieve a knowledge of the living plant, he says, let the botanist take to the field—*i.e.* be an outdoor botanist. As it is necessary "at the outset to make collections," the first chapter is devoted to methods of collecting and preserving plants, and he gives many useful hints to beginners. The several types of collections which may be made to illustrate particular aspects of the subject are also indicated.

Following this introduction is a long chapter —occupying more than a third of the volume— on ecology, "the study of the homes of plants, their mode of occurrence in the field, and the factors of their environment." Certainly here is an opportunity for the British outdoor botanist; but a perusal of the pages shows that the author has forgotten his original purpose, judging from the frequent references to exotic vegetation—*e.g.* mangrove swamps, desert plants in Asia and Africa, palms and wind witches, and others ranging from the Dead Sea and the Alps to the Badlands of North America. The sources of information here are too obvious for this to be the result of "study in the field," but rather what the author calls "armchair work"; no attempt is made to relate it to British ecology. The subject-matter is confused and rendered difficult for a beginner to appreciate by the absence of proper subject classification and sub-headings, and the whole reads like a collection of brief statements on plant habitats and communities. Misleading and contradictory statements are frequent—*e.g.* on p. 84, and again on p. 103, we are told that "the initial stage of a large proportion of the vegetation of the country is woodland." P. 91: "A wood association on a dry soil is a damp oakwood association." On p. 103 it becomes a "dry oakwood," and a "damp oakwood" is the typical woodland on "clay and loam." P. 74: "There is a pressure exerted by the atmosphere which increases with altitude." P. 76: "In a variety of ways temperature affects plants. It does not vary like the water supply"; and on the same page: "In peaty soils the water is inaccessible to plants, so they are xerophytic."

The author is on rather safer ground in the next chapter, on "Field Botany and Survey Work," and in a discursive way gives some sound advice on note-taking and sketching, and on avoiding work on too wide a field, advice which the author himself evidently finds a difficulty in following. Plans are given illustrating his "field to field" work, and he explains the use of squares, grids, and transects. Chapters follow on "Botany and Scenery," "Phenology," and "Nature Diaries," concluding with "Hints to the Teacher." There

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is also a glossary which, like much of the work, needs revision—*e.g.* "palisade tissue" is defined as the "water-conducting region of plant stems," and "chloroplasts" as "chlorophyll cells." With one of his dicta we heartily agree: "Since ecology and physiology are really complementary, neither can be adequately studied without the other." The volume includes a number of illustrations from photographs, many of which are exceedingly good and very well reproduced.

An Historical Catalogue of Science.

Bibliotheca Chemico-mathematica. Compiled and annotated by H. Z. and H. C. S. Vol. i. Pp. xii + 428 + plates. Vol. ii. Pp. 535 + plates. (London: Henry Sotheran and Co., 1921.) 3*l.* 3*s.* net.

THE mental stimulus to be gained by the study of the historical development of science is of much greater value than is sometimes supposed. He who follows, from the first vague beginnings, the efforts of many workers in various lands, leading at length to some great discovery, whether of practical or of theoretical significance, will be apt to ask himself the question: "Could not I also do something to help forward human knowledge?"

In this sale catalogue of more than 17,000 books on mathematics, astronomy, physics, chemistry, engineering, meteorology, and allied subjects there is ample opportunity for anyone to pick out books relating to his own special department. The search is rendered easy by a subject index.

The volumes comprise two catalogues arranged according to authors' names, together with a supplement, and give the date of publication and present price of each book. The whole work is due to Heinrich Zeitlinger, of Linz, and it is said to contain nearly all the standard works on the subjects catalogued, and most of the earlier works of historical importance.

The most striking features of the catalogue are the fascinating illustrations. They are prepared by a photographic process, and give excellent facsimile representations of title-pages, woodcuts, diagrams, and letterpress taken from more than one hundred books celebrated either for their quaintness or for having announced new discoveries of far-reaching importance. Thus there is a reproduction, on a reduced scale, of Galileo's famous proposition that a body starting from rest under uniform acceleration moves distances proportional to the square of the time. This is photographed from the first edition of his "Discorsi e Dimostrazioni Matematichi," published at Leyden in 1638. Another facsimile is taken from Huygens's "Traité de la Lumière," published in 1690, in which he deduced the equality of the angles of incidence and reflection from the wave theory of light. There are also beautiful reproductions from Kepler's "Dioptrice," published in 1611. The selected pages discuss the refraction of light and the formation of images by convex lenses.

Some pages from "De Beghinselen der Weeghconst," by Simon Stevinus, of Bruges, published in 1586, contain propositions on the inclined plane (triangle of forces), levers, and laws of floating bodies. Among other curious illustrations, we find an early velocipede from a book by Ovenden, dated 1774, and an early railway train, in which stage coaches, complete with driver, guard with coach-horn, and luggage on the roof, are being drawn by a quaint locomotive with a single rope.

Another illustration shows a very early electric telegraph devised in 1816 by Sir Francis Ronalds. The invention was offered to the Admiralty, but Sir Francis was officially answered that, now the French War was over, telegraphs of any kind were totally unnecessary, and that no other method of signalling than the semaphore then in use would be adopted.

From "Mathematicall Magick," by Bishop Wilkins (1648), are given some illustrations of perpetual motion. As it is obvious that the machines could not work, we wonder whether the Bishop, who was the first secretary to the Royal Society, ever tried the experiments!

These few examples will show that the illustrations are mainly selected to show great discoveries in their early stages.

Maps and Map-reading.

(1) *Topographic Maps and Sketch Mapping.* By Prof. J. K. Finch. Pp. xi + 175. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1920.) 13*s.* 6*d.* net.

(2) *Ordnance Survey Maps: Their Meaning and Use. With Descriptions of Typical 1-in. Sheets.* By Dr. Marion I. Newbigin. Second edition. Pp. 128. (Edinburgh: W. and A. K. Johnston, Ltd.; London: Macmillan and Co., Ltd., 1920.) 2*s.* net.

(3) *Notes on Geological Map-reading.* By A. Harker. Pp. 64. (Cambridge: W. Heffer and Sons, Ltd., 1920.) 3*s.* 6*d.* net.

(1) AS the author states in his preface, this book was the outcome of the demand for instruction in map-reading and field sketching

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